

## Dust Settlement in Orion Proplyds

Takuya Yamashita<sup>1</sup>, M. Ito<sup>2</sup>, S. Sako<sup>3</sup>, M. Honda<sup>2</sup>, H. Kataza<sup>4</sup>, T. Miyata<sup>3</sup>,  
Y.K. Okamoto<sup>5</sup>, T. Fujiyoshi<sup>1</sup>, H. Terada<sup>1</sup>, and T. Onaka<sup>2</sup>

(Email: [takuya@subaru.naoj.org](mailto:takuya@subaru.naoj.org))

<sup>1</sup>Subaru Telescope, National Astronomical Observatory of Japan, Hilo, Hawaii, USA

<sup>2</sup>Department of Astronomy, School of Science, University of Tokyo, Tokyo, Japan

<sup>3</sup>Institute of Astronomy, School of Science, University of Tokyo, Tokyo, Japan

<sup>4</sup>Department of Infrared Astrophysics, Institute of Space and Astronautical Science,  
Japan Aerospace Exploration Agency, Japan

<sup>5</sup>Center for Natural Science, College of Liberal Arts and Sciences, Kitasato University, Japan

We have made mid-infrared and H<sub>2</sub> emission surveys of Orion proplyds in order to study the behavior of gaseous and solid components within their circumstellar disks. Imaging observations at 11.7  $\mu\text{m}$  were made with COMICS on the 8.2-m SUBARU telescope. Several proplyds were extended but most of them were unresolved in the MIR. The H<sub>2</sub> emission at 2.12  $\mu\text{m}$  was observed for about 30 objects, one by one, with an echelle spectroscopic mode of IRCS on SUBARU and was detected for about half of the targets. We found an clear anti-correlation between the MIR flux density and the H<sub>2</sub> emission (i.e., proplyds strong in H<sub>2</sub> emission had weak MIR emission). This anti-correlation is naturally understood as an evolutionary sequence of evaporation for proplyds, in which gaseous and solid components are separated along the  $z$  direction within the circumstellar disk. We argue that the separation is likely to be caused by settlement of dust grains onto the disk equator.

